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10/667,042	09/22/2003	John P. O'Brien	5686-05-2	1437

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EXAMINER	
BERGIN, JAMES S	

ART UNIT	PAPER NUMBER
3641	

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,042	O'BRIEN ET AL.	
	Examiner	Art Unit	
	James S. Bergin	3641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *1 and 10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-9 and 11-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1, 3/1, 4/1, 10, 11/3/1, 12/11/3/1, 13/12/11/3/1 and 17/1, drawn to a method of making a transmission tube assembly, classified in class 86, subclass 1.1.

   II. Claims 2, 3/2, 4/2, 5-9, 11/3/2, 12/11/3/2, 13/12/11/3/2, 14-16 and 17/2 drawn to a transmission tube assembly, classified in class 102, subclass 275.1.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions 1 and 2 are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the transmission tube assembly of invention 2 could be formed by a different method to that of invention 1. Such a method could bond the two tubes together directly after the original extrusion of the tubes and then the bonded tubes could be spooled onto two storage spools for shipment. This would simplify the method by removing the steps of spooling and un-spooling the un-bonded individual tubes prior to the bonding step. Similarly, the tube assembly of invention 2 could be bonded by a double sided adhesive tape and need not necessarily involve the step of introducing an adhesive bead.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with John Hilton on 6/14/2005 a provisional election was made without traverse to prosecute invention 2, claims 2, 3/2, 4/2, 5-9, 11/3/2, 12/11/3/2, 13/12/11/3/2, 14-16 and 17/2. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1, 3/1, 4/1, 10-13 and 17/1, withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

6. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the quality of the scanned photographs is such that they are very difficult to interpret. It is difficult if not impossible to see any of the details of figs. 2-6 or to read many of the reference numerals thereon. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. Care should be taken to ensure that all the reference numbers that appear in the specification are clearly visible in the

drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

7. Claim 3/2 is objected to because of the following informalities: pentaphenaltetranitrate appears to be a misspelling.

8. Claim 4/2 is objected to because of the following informalities: in line 2, "plus" now appears to be redundant. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 2, 3/2, 4/2, 5-9, 11/3/2, 12/11/3/2, 13/12/11/3/2, 14-16 and 17/2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, lines 4 and 5, the limitation, *"along at least a substantially portion of the length of the tubes"* is indefinite. What defines a substantial portion of the length of the tubes?

In claim 3/2, it is unclear what precisely defines an equivalent to crystalline pentaphenaltetranitrate?

Regarding claim 4/2, a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989). The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 4 recites the broad recitation *"a vinyl acetate content of 2% to 20%"*, and the claim also recites "*preferably 12%*" which is the narrower statement of the range/limitation.

In claim 6, it is unclear what defines an equivalent to Surlyn. It is noted that the trademark Surlyn has been used in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

In claim 7, *"said redundant shock tube assembly"* and "*the redundant shock tube*" lack proper antecedent basis. As currently written, claim 7 would appear to be a method claim and should properly be withdrawn along with the other non-elected method of making claims.

In claim 8, "wherein packaging means is provided for said spool" is unclear because in page 6, [0025], the spool itself has been defined as the package for the redundant signal transmission leads. As currently written, claim 8 would appear to be a

method claim and should properly be withdrawn along with the other non-elected method of making claims

In claim 9, lines 2-5, the limitations, "the fixture", "the plastic bead", "the nozzle", "the extruded plastic bead", "the bead" all lack a proper antecedent basis. Claim 9 further defines the manufacturing apparatus for making the tube assembly. It would appear that claim 9 should properly depend from the non-elected method of making claims.

In claim 11/3/2, it is unclear which transmission tube the limitation, "said transmission tube", refers too? It is noted that claim 2 refers to "at least two discrete transmission tubes. It is unclear which layer of the tube is being fabricated from vinyl acetate because the applicant's tube appears to be a bi-layered tube as illustrated in Fig. 1.

Claim 12/11/3/2, is indefinite because 12% does not define a range.

In claim 15, it is unclear how the protective cap of the detonator can be "on the other end of the redundant shock tube" from the end which has the detonator crimped thereon? The limitation, "the spool", lacks a proper antecedent basis (claims 2 or 14 do not claim a spool). It is also unclear whether "on the end of a spool" of line 4 is part of the same spool as "the spool" of lines 2 and 4? The limitation, "opening sided container" is not understood. Should it perhaps read, "open sided container". The limitation "the redundant shock tube lacks a proper antecedent basis. Note that none of these features or relationships can be seen in the drawings due to the extremely poor quality of the drawings.

In claim 16, the spool lacks a proper antecedent basis as does the barrel of the spool (claims 2, 14 or 15 do not claim a spool). It is unclear whether the tube assembly exits the barrel of the spool through the tapered exit hole of the spool flange or just winds off the barrel of the spool? Note that none of these features or relationships can be seen in the drawings due to the extremely poor quality of the drawings.

11. As currently drafted, claim 9 cannot be reasonably addressed with an art rejection due to its indefiniteness.

12. The art-based rejections that follow are made in the light of the indefiniteness outlined above.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claims 2 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw (US 5,365,851 A) in view of Rey (US 2,877,708 A).

Regarding claim 2, Shaw discloses a redundant transmission tube assembly comprising at least two discrete transmission tubes 10 arranged in axially parallel and adjacent relationship (col. 8, lines 8-22; fig. 3), each tube 10 have a percussive powder

composition inside the tubes (col. 4, lines 5-12), the adjacent tubes 10 inherently bonded together (fig. 3) along at least a substantial portion of the length of said tubes, said tubes being extruded from a synthetic polymer (col. 4, lines 5-12). Shaw is silent as to precisely how the tubes 10 are bonded together, but they are definitely bonded together (fig. 3). Shaw does not explain how the transmission tubes 10 are bonded together.

However, Rey (US 2,877,708 A) discloses an equivalent means for bonding tubes together such as plastic strip 4 bonding fuse tubes 3 in an axially parallel and adjacent relationship (col. 2, line 60 – col. 3, line 8; figs. 1-4) in such a way that they can be separated by cutting the strip if so desired (col. 3, lines 36-41).

It would have been an obvious substitution of a functional equivalent, in view of Rey, to one of ordinary skill in the art at the time that the invention was made, to use a polymeric strip having adhesive properties to bond Shaw's tubes in their axially parallel and adjacent relationship, enabling the Shaw's tubes to separated by cutting the strip if so desired.

Regarding claim 14, Shaw discloses that initiators 54 and detonators 57 are affixed to the redundant shock tube assembly at opposite ends thereof (col. 3, lines 8-40; fig. 3).

Regarding claim 15, Shaw discloses the detonators 57 crimped to one end of the shock tube and being covered by detonator caps 14 (fig. 3), both mounted to an end of the spool 12 by virtue if the shock tubes 10 (fig. 3). Shaw's spool is capable of being housed in an open sided container such as a dispensing box. Note that none of these

features or relationships can be seen in the applicant's drawings due to the extremely poor quality of those drawings.

Regarding claim 16, in as much as this claim can be understood due to its indefiniteness, Shaw discloses the spool 12 comprising a flange at each end and at least two holes. Note that none of these features or relationships can be seen in the applicant's drawings due to the extremely poor quality of those drawings

15. Claims 3/2, 4/2, 5-8, 11/3/2 and 12/11/3/2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw (US 5,365,851 A) in view of Rey (US 2,877,708 A) as applied to claim 2 above, and further in view of Thureson et al. (US 4,607,573 A).

Regarding claim 3/2, Shaw discloses a reactive mixture adhered to the inner surface of the adherent layer of the plastic tube 10 (col. 4 lines 8-12). Shaw does not specifically name this reactive mixture. However, Thureson et al. discloses reactive mixtures comprising PETN or RDX or HMX etc. (col. 3, lines 1-9). Thureson et al.'s reactive mixtures are equivalent to the applicant's claimed reactive mixture in claim 3/2. (It should be noted that applicant discloses on page 4, [0017] that the reactive mixture can comprise HMX). It would have been obvious, in view of Thureson et al., to one of ordinary skill in the art at the time that the invention was made, to select a reactive mixture comprising HMX or its equivalent, as the reactive mixture lining the tubes of the Shaw/ Rey combination, and thereby utilize a ubiquitously well known and readily available reactive mixture.

Regarding claim 4/2, neither Shaw nor Rey disclose an adhesive comprising EVA copolymer with a vinyl acetate content ranging from 2% to 20% and preferably 12%.

However Thureson et al. '573 disclose the plastic adhesive EVA (ethylene vinyl acetate) that possesses excellent adhesive properties (col. 3, lines 1-5).

It would have been an obvious, in view of Thureson et al., to one of ordinary skill in the art at the time that the invention was made, to select the plastic adhesive EVA (ethylene vinyl acetate) as the constituent plastic adhesive of the polymeric strip of the Shaw/ Rey combination, and so avail of its excellent adhesive properties in bonding the tubes together. It would further have been obvious to one having ordinary skill in the art at the time the invention was made to select the EVA copolymer adhesive with a vinyl acetate content somewhere in the range 2% to 20%, preferably 12%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges and discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Aller*, 105 USPQ 233 and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 5, Shaw discloses that the shock tube 10 comprises an outer resilient layer (col. 4, lines 10-12). However, Shaw does not state that this layer comprises polyethylene or nylon.

However, Thureson et al. '573 disclose a shock tube comprising an outer layer of polyethylene or nylon, to improve the ability of the tube to withstand external damage and mechanical stress (col. 3, lines 14-23). It would have been obvious, in view of

Thureson et al., to one of ordinary skill in the art at the time that the invention was made to select polyethylene or nylon as the outer layer of Shaw's tube 10, and thereby improve its ability to withstand external damage and mechanical stress.

Regarding claim 6, Shaw discloses the shock tube 10 comprises an inner adherent layer (col. 4, lines 8-12) but does not state that this layer comprises SURLYN.

However, Thureson et al. discloses the plastic tube 22 comprising SURLYN (col. 2, lines 65-67; fig. 2), such plastics providing excellent adhesion of the outer coating layer 24 (col. 3, lines 1-5). It would have been obvious, in view of Thureson et al., to one of ordinary skill in the art at the time that the invention was made to select SURLYN as constituent material of Shaw's inner adherent layer and so advantageously provide excellent adhesion of Shaw's outer layer thereto.

Regarding claim 7, discloses the spool 12 (col. 8, lines 8-40; fig. 3).

Regarding claim 8, in as much as the claim can be understood due to it's indefiniteness (see above), Shaw discloses that the redundant signal transmission leads10 are packaged on the spool (col. 8, lines 8-40; fig. 3).

Regarding claims 11/3/2 and 12/11/3/2, in as much as the claims can be understood due to there indefiniteness (see above), Shaw discloses the shock tube 10 comprising an inner adherent layer (col. 4, lines 8-12) but does not state that this layer is fabricated from a plastic polymer having a vinyl acetate content of between 2% to 20% by weight.

However, However Thureson et al. '573 disclose a tube 22 with an inner layer comprising the plastic ethylene vinyl acetate that provides excellent adhesion of the outer coating layer 24(col. 2, lines 65-67 and col. 3, lines 1-5; Fig. 2).

It would have been obvious, in view of Thureson et al., to one of ordinary skill in the art at the time that the invention was made to select the plastic polymer ethylene vinyl acetate as the constituent material of Shaw's inner adherent layer and so advantageously provide excellent adhesion of Shaw's outer layer thereto. It would further have been obvious to one having ordinary skill in the art at the time the invention was made to select the ethylene vinyl acetate layer with a vinyl acetate content somewhere in the range 2% to 20%, preferably 12%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges and discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Aller*, 105 USPQ 233 and *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

16. Claim 17/2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw (US 5,365,851 A) in view of Rey (US 2,877,708 A) as applied to claim 2 above, and further in view of Shaw (US 5,001,981)

Shaw '851 does not disclose that each shock tube 10 is of a different external color for identification purposes. However, Shaw '981 discloses that the individual shock tubes 17 may be color coded to ensure that they are properly connected to the desired initiators and detonators (col. 4, lines 37-41). It would have been obvious, in view of Shaw '981, to one of ordinary skill in the art at the time that the invention was

made to color code the shock tubes of the Shaw '851/ Rey combination, so as to ensure that they be properly connected to the desired initiators and detonators.

Allowable Subject Matter

17. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

18. Note that claim 9 is so indefinite that it cannot rationally be addressed with an art rejection as currently drafted.

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Langrish-Smith et al. (US 3,867,884) discloses an explosive fuse cord having an adhesive outer sheath comprising from 7% to 30% of the co-polymer vinyl acetate. McBride (US 2,663,755 A); Welsh (US 3,320,883 A); Per-Anders Persson (US 3,590,739 A); Kristensen et al. (US 4,328,753 A) and O'Brien et al. (US 6,272,996 B1) have also been cited as examples of art relevant to the claims.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Bergin whose telephone number is 571-272-6872. The examiner can normally be reached on Monday - Wednesday and Friday, 8.30 - 5.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Bergin

MICHAEL J. CARONE
SUPERVISORY PATENT EXAMINER